BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Diploma in Manufacturing Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Manufacturing Engineering
Unit number and title	**Unit 39: Modern Manufacturing Systems**
Learning aim(s)	**C:** Investigate the principles of Lean manufacturing and how these influence productivity
Assignment title	The potential advantages of adopting the Lean philosophy
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You have recently started an apprenticeship with a small manufacturing company which is very traditional in its approach to manufacturing. Your supervisor has read your CV and noticed that one of the units you studied in your BTEC programme at school covered the principles and methods/tools associated with Lean. This is something that the Operations Director has talked about in the past as a way of improving the productivity and responsiveness of your company. Your supervisor is keen to find out more about Lean and how it might be applied in practice on the shop floor in your factory. He is also keen that other members of the production team should get involved from the beginning so they understand Lean principles and ways of working. As such he has asked you to share your knowledge and give a presentation to colleagues on the key characteristics of Lean operations and the ways in which Lean tools and methods might help to achieve these in practice. To make the presentation as engaging and persuasive as possible he has also asked that you give a practical demonstration of the effectiveness of some common Lean tools/methods by running and documenting a Lean simulation(s) to show what could be achieved.

Task 1	Set-up a lean simulation (or simulations) based on an element of a manufacturing environment and record evidence of: ● the details of the problem(s) it is designed to eliminate ● the expected outcome of the simulation(s) ● how the simulation(s) will be set up and controlled ● how a range of at least three Lean tools and/or methods will be applied to the simulation(s) ● the actual outcome obtained Your presentation should then provide detailed information

	on: ● the key characteristics of (for example, short lead times, minimum work-in-progress, defect elimination etc) and reasons for (for example, eliminating waste, improving quality, increasing flexibility etc) adopting Lean principles in a manufacturing environment, and the requirements needed to implement it successfully (for example, a team approach, continuous improvement, dependable suppliers etc) ● how Lean principles would be implemented in practice by employing the three Lean tools/methods used in the above simulation(s) (for example, by using Kanban, Bottleneck analysis, 5S etc); specify the problem that each Lean tool/method is designed to eliminate, the methodology involved in the use of each Lean tool and their expected impact on the processes involved with reference to the principles of Lean operations ● the simulations(s) undertaken, including the details of the problem(s) it was designed to eliminate, the expected outcome of the simulation(s), how the simulation(s) was set up and controlled, how a range of at least three Lean tools and/or methods were applied to the simulation(s) and the actual outcomes obtained ● how effective the three Lean tools and/or methods are in helping to achieve the key characteristics of Lean operations, with reference to the outcomes of the simulation(s) undertaken ● which of the three Lean tools/methods make the most effective contribution to supporting the key characteristics of Lean.
Checklist of evidence required	● Annotated photographs/video with commentary showing the lean manufacturing simulation(s) being carried out ● A tutor observation record confirming the manufacturing simulation(s) was carried out by the learner ● A printed copy of the presentation (with embedded images/video) including presenter notes

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
39/C.P5	Explain the key characteristics of Lean and the requirements needed to implement it successfully
39/C.P6	Explain how at least one Lean tool and/or method can be applied.
39/C.P7	Demonstrate effectively at least one of the key Lean tools, using a manufacturing simulation
39/C.M3	Analyse how a range of Lean tools and/or methods relate back to the key characteristics of Lean simulation
39/C.M4	Demonstrate effectively a range of the key Lean tools and/or methods using a manufacturing simulation
39/C.D3	Evaluate how a range of Lean tools and/or methods relate back to the key characteristics of Lean including the effectiveness of a Lean manufacturing simulation

Sources of information to support you with this Assignment	**Books** Slack, Nigel, Alistair Brandon-Jones, and Robert Johnston. 2012. *Operations Management*. 7th ed. Harlow: Financial Times Prentice Hall. ISBN 9780273776208 Liker, Jeffrey K. 2004. *The Toyota Way*. 2nd ed. New York: McGraw-Hill. ISBN 9780071392310 Dennis, Pascal. 2007. *Lean Production Simplified: A Plain Language Guide To The World's Most Powerful Production System.* 2nd Ed. Productivity Press. ISBN 9781563273568 **Websites** Toyota. 2016. Toyota Production System. [Online]. Available from: toyota-global.com/company/vision_philosophy/toyota_production_system/ Lean Simulations. 2012. List of Lean Games and Simulations. [Online]. Available from: leansimulations.org/p/huge-list-of-free-lean-games.html Lean Simulations. 2011. Seven Benefits of Teaching Lean with Simulations. [Online]. Available from: leansimulations.org/2011/01/seven-benefits-of-teaching-lean-with.html Lean Games. 2016. Lean Games website. [Online]. Available from: leangames.co.uk Above are some examples of websites. Further useful resources may be found at qualifications.pearson.com/en/support/published-resources.html#step1